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**BIOCHEMICAL ASSESSMENT OF KIDNEY FUNCTIONS IN DIABETIC
SUDANESE SUBJECTS**

A thesis submitted in partial fulfilment of the requirements for the degree of
Master of Biochemistry

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Khartoum-Sudan

2017

Dedication

To

My parents

For making everything worthwhile

My brothers and sister

For giving me love and inspiration

My friends

For their abundant support and their love

Atsaad

Acknowledgments

First of all, I would like to thank Dr.Fatima Alsammani Alsheikh for supervising and guiding my work, and for her support throughout my dissertation. I very much appreciate her input and I am very grateful for always finding an open door.

I would like to thank Prof. Khalid Eltom for giving me the opportunity to accomplish his work.

My special thanks to Prof. Mohammed Alsheikh Barri for his support and guiding my work. I very much appreciate his input .

Finally, I am very much obliged to all the subjects who participated in the study.

Abbreviation

Term	Abbreviation
DM	Diabetes Mellitus
OGTT	Oral glucose tolerance test
HbA1C	Glycated hemoglobin
T1D	Type 1 diabetes mellitus
IDDM	Insulin-dependent diabetes mellitus
MS	Multiple sclerosis
T2DM	Type 2 diabetes mellitus
HDL	High - density lipoprotein
GDM	Gestational diabetes mellitus
IFG	Impaired fasting glucose
IGT	Impaired glucose tolerance
DKA	Diabetic ketoacidosis
CVD	Cardiovascular disease
GFR	Glomerular filtration rate
PCT	Proximal convoluted tubule
eGFR	Estimated glomerular filtration rates
SPSS	Statistical package for social sciences
Conc Std	Concentration of standard
WHO	World Health Organization
MS	multiple sclerosis

ABSTRACT

Diabetes mellitus (DM) is a major public health problem in Sudan. The aim of this study is to determine the occurrence and risk factors of renal functions complications among diabetic patients.

The study was carried out in Jabber Abu Elezz diabetics center in Khartoum , in Khartoum state, Sudan , as a case control study .

The objective to correlate the creatinine and microalbuminuria with the blood glycated hemoglobin (HbA1c) and duration in diabetic Sudanese subjects.

Fifty five patients with type 2 diabetes mellitus (26 male and 29 female) and 11 patients with type 1 diabetes mellitus were included in the study .Their ages range between 40 -65 years .Thirty matched normal individual were taken as control group .

The mean of whole blood glycated hemoglobin (HbA1c) in diabetic patient male with type 2, male type 1and female with type 2 (9.3 ± 2.8 , 9.9 ± 1.6 , 8.6 ± 2.1) % respectively. Their Fasting Blood Glucose (FBG)(211.2 ± 78.6 , 258.4 ± 119.8 , 220.1 ± 97.9)mg/dl respectively. Creatinine (1.2 ± 0.2 , 1.1 ± 0.3 , 0.96 ± 0.2) mg/dl respectively .

Microalbuminuria (55.8 ± 106.3 , 31.2 ± 13.6 , 33.8 ± 63.3) mg/dl respectively, were significantly higher in all patients compared to the control groups. Results showed significant increase in DM female, male type 2 and male type 1 ($P<0.05$) compared to the control group .

المستخلص

يعتبر داء السكري من المشاكل الصحية في السودان ، إن الهدف من هذه الدراسة ربط وظائف الكلى (الكرياتينين وبروتين البول) بين مرضى السكري من النوع الأول والثاني .

أجريت هذه الدراسة في مركز جابر أبو العز التخصصي للسكري بولاية الخرطوم في منطقة نمرة 2 ، في مدينة الخرطوم ، السودان .

وقد شملت خمسة وخمسون مريضاً " بداء السكري من النوع الثاني (26 ذكر و 29 أنثى) وأحد عشر مريضاً " بداء السكري من النوع الأول . تتراوح أعمارهم بين 40 – 65 سنة . 30 فرداً " لهم جنس وعمر مماثل أخذوا كمجموعة ضابطة .

متوسط السكر التراكمي للذكور من النوع الثاني ، والنوع الأول والإناث من النوع الثاني كان % (2.8 ± 9.3 , 1.6 ± 9.9 , 2.1 ± 8.6) على التوالي . ومتوسط جلوكوز دم الصائم ملجم / 100 مل (78.6 ± 211.2 , 119.8 ± 258.4 , 97.9 ± 220.1) على التوالي .

ومتوسط الكرياتينين ملجم / 100 مل (0.2 ± 1.2 , 0.3 ± 1.1 , 0.2 ± 0.96) على التوالي . ومتوسط بروتين البول ملجم / 100 مل (106.3 ± 55.8 , 13.6 ± 31.2 , 63.3 ± 33.8) على التوالي بمستوى ثقة عالي ، مقارنة بمجموعة الضبط .

كشفت النتائج ارتباط وثيق بين بروتين البول وارتفاع السكر بالفئات العمرية وفترة الإصابة .

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